the type and number of each external fuel combustion unit.

(4) Internal fuel combustion sources, not compressor-drivers, with a rated heat capacity equal to or less than 1 mmBtu/hr (or the equivalent of 130 horsepower), do not need to report combustion emissions or include these emissions for threshold determination in §98.231(a). You must report the type and number of each internal fuel combustion unit.


§98.234 Monitoring and QA/QC requirements.

The GHG emissions data for petroleum and natural gas emissions sources must be quality assured as applicable as specified in this section. Offshore petroleum and natural gas production facilities shall adhere to the monitoring and QA/QC requirements as set forth in 30 CFR 250.

(a) You must use any of the methods described as follows in this paragraph to conduct leak detection(s) of equipment leaks and through-valve leakage from all source types listed in §98.233(k), (o), (p) and (q) that occur during a calendar year, except as provided in paragraph (a)(4) of this section.

(1) **Optical gas imaging instrument.** Use an optical gas imaging instrument for equipment leak detection in accordance with 40 CFR part 60, subpart A, §60.18 of the Alternative work practice for monitoring equipment leaks, §60.18(i)(1)(i); §60.18(i)(2)(i) except that the monitoring frequency shall be annual using the detection sensitivity level of 60 grams per hour as stated in 40 CFR Part 60, subpart A, Table 1: Detection Sensitivity Levels; §60.18(i)(2)(ii) and (iii) except the gas chosen shall be methane, and §60.18(i)(2)(iv) and (v); §60.18(i)(3); §60.18(i)(4)(i) and (v); including the requirements for daily instrument checks and distances, and excluding requirements for video records. Any emissions detected by the optical gas imaging instrument is a leak unless screened with Method 21 monitoring, in which case 10,000 ppm or greater is designated a leak. In addition, you must operate the optical gas imaging instrument to image the source types required by this subpart in accordance with the instrument manufacturer’s operating parameters. Unless using methods in paragraph (a)(2) of this section, an optical gas imaging instrument must be used for all source types that are inaccessible and cannot be monitored without elevating the monitoring personnel more than 2 meters above a support surface.

(2) **Method 21.** Use the equipment leak detection methods in 40 CFR part 60, appendix A–7, Method 21. If using Method 21 monitoring, if an instrument reading of 10,000 ppm or greater is measured, a leak is detected. Inaccessible emissions sources, as defined in 40 CFR part 60, are not exempt from this subpart. Owners or operators must use alternative leak detection devices as described in paragraph (a)(1) or (a)(2) of this section to monitor inaccessible equipment leaks or vented emissions.

(3) **Infrared laser beam illuminated instrument.** Use an infrared laser beam illuminated instrument for equipment leak detection. Any emissions detected by the infrared laser beam illuminated instrument is a leak unless screened with Method 21 monitoring, in which case 10,000 ppm or greater is designated a leak. In addition, you must operate the infrared laser beam illuminated instrument to detect the source types required by this subpart in accordance with the instrument manufacturer’s operating parameters.

(4) [Reserved]

(5) **Acoustic leak detection device.** Use the acoustic leak detection device to detect through-valve leakage. When using the acoustic leak detection device to quantify the through-valve leakage, you must use the instrument manufacturer's calculation methods to quantify the through-valve leak. When using the acoustic leak detection device, if a leak of 3.1 scf per hour or greater is calculated, a leak is detected. In addition, you must operate the acoustic leak detection device to monitor the source valves required by this subpart in accordance with the instrument manufacturer’s operating parameters. Acoustic stethoscope type devices designed to detect through valve leakage when put in contact with
the valve body and that provide an audible leak signal but do not calculate a leak rate can be used to identify non-leakers with subsequent measurement required to calculate the rate if through-valve leakage is identified. Leaks are reported if a leak rate of 3.1 scf per hour or greater is measured.

(b) You must operate and calibrate all flow meters, composition analyzers and pressure gauges used to measure quantities reported in §98.233 according to the procedures in §98.3(i) and the procedures in paragraph (b) of this section. You may use an appropriate standard method published by a consensus-based standards organization if such a method exists or you may use an industry standard practice. Consensus-based standards organizations include, but are not limited to, the following: ASTM International, the American National Standards Institute (ANSI), the American Gas Association (AGA), the American Society of Mechanical Engineers (ASME), the American Petroleum Institute (API), and the North American Energy Standards Board (NAESB).

(c) Use calibrated bags (also known as vent bags) only where the emissions are at near-atmospheric pressures and below the maximum temperature specified by the vent bag manufacturer such that the bag is safe to handle. The bag opening must be of sufficient size that the entire emission can be tightly encompassed for measurement till the bag is completely filled.

(1) Hold the bag in place enclosing the emissions source to capture the entire emissions and record the time required for completely filling the bag. If the bag inflates in less than one second, assume one second inflation time.

(2) Perform three measurements of the time required to fill the bag, report the emissions as the average of the three readings.

(3) Estimate natural gas volumetric emissions at standard conditions using calculations in §98.233(t).

(4) Estimate CH₄ and CO₂ volumetric and mass emissions from volumetric natural gas emissions using the calculations in §98.233(u) and (v).

(d) Use a high volume sampler to measure emissions within the capacity of the instrument.

(1) A technician following manufacturer instructions shall conduct measurements, including equipment manufacturer operating procedures and measurement methodologies relevant to using a high volume sampler, including positioning the instrument for complete capture of the equipment leak without creating backpressure on the source.

(2) If the high volume sampler, along with all attachments available from the manufacturer, is not able to capture all the emissions from the source then use anti-static wraps or other aids to capture all emissions without violating operating requirements as provided in the instrument manufacturer's manual.

(3) Estimate natural gas volumetric emissions at standard conditions using calculations in §98.233(t). Estimate CH₄ and CO₂ volumetric and mass emissions from volumetric natural gas emissions using the calculations in §98.233(u) and (v).

(4) Calibrate the instrument at 2.5 percent methane with 97.5 percent air and 100 percent CH₄ by using calibrated gas samples and by following manufacturer's instructions for calibration.

(e) Peng Robinson Equation of State means the equation of state defined by Equation W–41 of this section:

\[
p = \frac{RT}{V_m - b} - \frac{a\alpha}{V_m^2 + 2bV_m - b^2} \quad \text{(Eq. W–41)}
\]

Where:

\[p = \text{Absolute pressure.}\]
\[R = \text{Universal gas constant.}\]
\[T = \text{Absolute temperature.}\]
\[V_m = \text{Molar volume.}\]
Where:

\( w \) = Acentric factor of the species.

\( T_c \) = Critical temperature.

\( P_c \) = Critical pressure.

\[
\begin{align*}
0.45724R^2T_c^2 & \\
\frac{a}{p_c} & = \\
0.7780RT_c & \\
\frac{b}{p_c} & \\
\alpha & = 1 + (0.37464 + 1.54226w - 0.26992w^2) \left(1 - \frac{T}{T_c}\right)^2
\end{align*}
\]

(i) Special reporting provisions. (1) Best available monitoring methods. EPA will allow owners or operators to use best available monitoring methods for parameters in §98.233 Calculating GHG Emissions as specified in paragraphs (f)(2), (f)(3), and (f)(4) of this section. If the reporter anticipates the potential need for best available monitoring for sources for which they need to petition EPA and the situation is unresolved at the time of the deadline, reporters should submit written notice of this potential situation to EPA by the specified deadline for requests to be considered. EPA reserves the right to review best available monitoring method requests submitted after the deadlines specified in this section, and will consider requests which demonstrate unique or unusual circumstances unforeseen at the time of the applicable best available monitoring method deadline. The Administrator reserves the right to request further information in regard to all petition requests. The owner or operator must use the calculation methodologies and equations in §98.233 Calculating GHG Emissions. Best available monitoring methods means any of the following methods specified in paragraph (f)(1) of this section:

(i) Monitoring methods currently used by the facility that do not meet the specifications of this subpart.

(ii) Supplier data.

(iii) Engineering calculations.

(iv) Other company records.

(2) Best available monitoring methods for well-related emissions. During January 1, 2011 through December 31, 2011, owners and operators may use best available monitoring methods for any well-related data that cannot reasonably be measured according to the monitoring and QA/QC requirements of this subpart. These well-related sources are:

(i) Gas well venting during well completions and workovers with hydraulic fracturing as specified in §98.233(g).

(ii) Well testing venting and flaring as specified in §98.233(l).

(3) Best available monitoring methods for specified activity data. During January 1, 2011 through December 31, 2011, owners or operators may use best available monitoring methods for activity data as listed below that cannot reasonably be obtained according to the monitoring and QA/QC requirements of this subpart. These sources are:

(i) Cumulative hours of venting, days, or times of operation in §98.233(e), (f), (g), (h), (l), (o), (p), (q), and (r).

(ii) Number of blowdowns, completions, workovers, or other events in §98.233(f), (g), (h), (l), and (w).

(iii) Cumulative volume produced, volume input or output, or volume of fuel used in paragraphs §98.233(d), (e), (j), (k), (l), (m), (n), (x), (y), and (z).
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(4) Best available monitoring methods for leak detection and measurement. During January 1, 2011 through December 31, 2011, owners or operators may use best available monitoring methods for sources requiring leak detection and/or measurement that cannot reasonably be obtained according to the monitoring and QA/QC requirements of this part. These sources include:

(i) Reciprocating compressor rod packing venting in onshore natural gas processing, onshore natural gas transmission compression, underground natural gas storage, LNG storage, and LNG import and export equipment as specified in §98.232(d)(1), (e)(1), (f)(1), (g)(1), and (h)(1).

(ii) Centrifugal compressor wet seal oil degassing venting in onshore natural gas processing, onshore natural gas transmission compression, underground natural gas storage, LNG storage, and LNG import and export equipment as specified in §98.232(d)(2), (e)(2), (f)(2), (g)(2), and (h)(2).

(iii) Acid gas removal vent stacks in onshore petroleum and natural gas production and onshore natural gas processing as specified in §98.232(c)(17) and (d)(6).

(iv) Equipment leak emissions from valves, connectors, open ended lines, pressure relief valves, block valves, control valves, compressor blowdown valves, orifice meters, other meters, regulators, vapor recovery compressors, centrifugal compressor dry seals, and/or other equipment leaks in onshore natural gas processing, onshore natural gas transmission compression, underground natural gas storage, LNG storage, LNG import and export equipment, and natural gas distribution as specified in §98.232(d)(7), (e)(7), (f)(5), (g)(3), (h)(4), and (i)(1).

(v) Condensate (oil and/or water) storage tanks in onshore natural gas transmission compression as specified in §98.232(e)(3).

(5) Requests for the use of best available monitoring methods. (i) No request or approval by the Administrator is necessary to use best available monitoring methods between January 1, 2011 and December 31, 2011 for sources specified in paragraph (f)(3) of this section.

(iii) No request or approval by the Administrator is necessary to use best available monitoring methods between January 1, 2011 and December 31, 2011 for sources specified in paragraph (f)(4) of this section.

(iv) No request or approval by the Administrator is necessary to use best available monitoring methods for data that cannot reasonably be obtained between January 1, 2011 and December 31, 2011 for sources not listed in paragraph (f)(2), (f)(3), and (f)(4) of this section.

(6)–(7) [Reserved]

(8) Requests for extension of the use of best available monitoring methods beyond 2011 for sources listed in paragraphs (f)(2), (f)(3), (f)(4), and (f)(5)(iv) of this section—(i) Timing of request. EPA does not anticipate a need for best available monitoring methods beyond 2011, but for all reporting years after 2011, best available monitoring methods will be considered for unique or unusual circumstances which include data collection methods that do not meet safety regulations, technical infeasibility, or counter to other local, State, or Federal regulations. For use of best available monitoring methods in 2012, an initial notice of intent to request best available monitoring methods must be submitted by December 31, 2011. Any notice of intent submitted prior to the effective date of this rule cannot be used to meet this December 31, 2011 deadline; a new notice of intent must be signed and submitted by the designated representative. In addition to the initial notification of intent, owners or operators must also submit an extension request containing the information specified in §98.234(f)(8)(ii) by March 30, 2012. Any best available monitoring methods request submitted prior to the effective date of this rule cannot be used to meet the March 30, 2012 deadline; a new best available monitoring methods request must be signed and submitted by the designated representative. Owners or operators that submit both a timely notice of intent and extension request consistent with §98.234(f)(8)(ii) can automatically use best available monitoring method.
through June 30, 2012, for the specific parameters identified in their notification of intent and best available monitoring methods request regardless of whether the best available monitoring methods request is ultimately approved. Owners or operators that submit a notice of intent but do not follow up with a best available monitoring methods request by March 30, 2012 cannot use best available monitoring methods in 2012. For 2012, when an owner or operator has submitted a notice of intent and a subsequent best available monitoring method extension request, use of best available monitoring methods will be valid, upon approval by the Administrator, until the date indicated in the approval or until December 31, 2012, whichever is earlier. For reporting years after 2012, a new request to use best available monitoring methods must be submitted by June 30th of the year prior to the reporting year for which use of best available monitoring methods is sought.

(ii) Content of request. Requests must contain the following information:

(A) A list of specific source categories and parameters for which the owner or operator is seeking use of best available monitoring methods.

(B) For each specific source for which an owner or operator is requesting use of best available monitoring methods, a description of the unique or unusual circumstances, such as data collection methods that do not meet safety regulations, technical infeasibility, or specific laws or regulations that are counter to data collection methods that conflict with each specific source.

(C) A detailed explanation and supporting documentation of how and when the owner or operator will comply with all of the subpart W reporting requirements for which use of best available monitoring methods are sought.

(iii) Approval criteria. To obtain approval to use best available monitoring methods after December 31, 2011, the owner or operator must submit a request demonstrating to the Administrator’s satisfaction that the owner or operator faces unique or unusual circumstances which include, by way of example and not in limitation, clearly demonstrated data collection methods that do not meet safety regulations, technical infeasibility, or counter to other local, State, or Federal regulations, along with the reasons the owner or operator cannot otherwise address the unique or unusual circumstances as required to be demonstrated in this paragraph.

(g) For the purposes of fulfilling requirements in 40 CFR 98.233(f) and (g) which require measurements to be taken every other year beginning in the first year of data collection, reporters have the option of taking the first measurement in 2012 to satisfy the requirements for the 2011–2012 data collection cycle.

(h) [Reserved]

§ 98.235 Procedures for estimating missing data.

A complete record of all estimated and/or measured parameters used in the GHG emissions calculations is required. If data are lost or an error occurs during annual emissions estimation or measurements, you must repeat the estimation or measurement activity for those sources as soon as possible, including in the subsequent calendar year if missing data are not discovered until after December 31 of the year in which data are collected, until valid data for reporting is obtained. Data developed and/or collected in a subsequent calendar year to substitute for missing data cannot be used for that subsequent year’s emissions estimation. Where missing data procedures are used for the previous year, at least 30 days must separate emissions estimation or measurements for the previous year and emissions estimation or measurements for the current year of data collection. For missing data which are continuously monitored or measured, (for example flow meters), or for missing temperature or pressure data that are required under §98.236, the reporter may use best available data for use in emissions determinations. The reporter must record and report the basis for the best available data in these cases.